Cost and Software Data Reporting Training

Software Resource Data Report (SRDR)
Planning Module

Schedule

DAY 1	DAY 2	DAY 3
0800 Class Orientation	0800 Contract Planning	0900 Question / Answer Session
0830 Background / Familiarization Module	0915 SRDR Planning (Part 1)	930 Validation (Part 1)
0945 Break	1015 Break	1015 Break
1000 WBS Module	1030 SRDR Planning (Part 2)	1030 Validation (Part 2)
1130 Lunch	1130 Lunch	1130 Lunch
1230 RAM Module	1230 Contracting	1230 SRDR Reporting
1330 Evolutionary Acquisition	1330 Cost Reporting (Part 1)	1400 Break
1430 Break	1500 Break	1415 Final Exam
1445 Program Planning Module	1515 Cost Reporting (Part 2)	1615 Wrap-Up

Outline

- SRDR Introduction
- SRDR Planning
- Additional Resources

Lesson Assignment Sheet

- Objectives:
  - For students to learn about SRDRs and SRDR planning
- Desired Learning Outcomes:
  - Be familiar with SRDR reporting requirements and thresholds
  - Understand the basic concepts of software reporting in the CSDR planning process
  - Identify the key software reporting items necessary for CSDR plan approval
- Assignments:
  - EXERCISE 8-1. SRDR Thresholds
  - EXERCISE 8-2. SRDR Elements
  - EXERCISE 8-3. SRDR Reporting Events
- Reference Material:
  - CSDR Reference Book
    - DoD 5000.4-M-2, *Software Resources Data Report (SRDR) Manual*, February 2004
    - DD Form 2630-1, *SRDR Initial Government Report,* February 2004
    - DD Form 2630-2, *SRDR Initial Developer Report,* February 2004
    - DD Form 2630-3, *SRDR Final Developer Report,* February 2004

What is the SRDR?

- The Software Resource Data Report is a contract data deliverable that formalizes the reporting of software metric data
- It uses a series of customizable form templates (DD 2630) and associated dictionaries to report and define the data.
- SRDR reporting is designed to record both the expectations and actual results of new software developments or upgrades.

The SRDR: What It's Not

- It's not a device for collection of financial data
- It's not intended as a project management device (it's not designed to 'track' software progress)
- It's not intended to track purchase or licensing costs associated with commercial software
- It's not supposed to overburden the contractor with data items that are not part of their standard process

Why Are SRDRs Needed?

- DoD lacks a centralized repository of data from contemporary software development projects
  - It is not clear what software costs are captured on CCDR forms
  - No systematic and standardized process was implemented to collect software metric information on completed software development efforts

The SRDR helps close DoD's software data gap

SRDR Reporting Requirements

Event	Report Due	Who Provides?	Scope of Report
Pre-Contract (180 days prior to award)	**2630-1**	**Government Program Office**	**High level estimates of the entire completed project.**
Contract award	**2630-2**	**Contractor**	**Estimates of the entire project.**
At start of each build	**2630-2**	**Contractor**	**Estimates for the build only.**
At end of each build	**2630-3**	**Contractor**	**Actuals for the build only.**
Contract Completion	**2630-3**	**Contractor**	**Actuals for the entire project.**

SRDR Planning

SRDR Planning

- The current DoD 5000.4-M-2 requires

  "For all programs, the CWIPT identifies specific data that satisfy the SRDR template and that are meaningful for the subject program. Using this guidance, the government program manager (PM) and the CWIPT develop a customized SRDR together with a set of data definitions and instructions. …The PM also develops Request For Proposal (RFP) language and a draft Contract Data Requirements List (CDRL). The PM summarizes the elements for which software resource measurement data are desired in a software resources measurement plan. The plan, including the customized SRPR, the data definitions, the draft RFP, CDRL, and DID, are to be provided to prospective developers for comments. The PM and the CWIPT will finalize the plan and submit it to the CAIG Chairman for approval."

- Unlike the CCDRs, SRDRs are customized to each contractor

SRDR Planning

1. Identify SRDR reporting contractors (Who?)
2. Identify and customize data elements (What?)
3. Identify system components to report (Where?)
4. Identify reporting events (When?)
5. Develop customized SRDR and dictionary (How?)
6. Develop draft RFP and CDRL language
7. Provide to prospective contractors and request comments
8. Finalize package and submit for CAIG Chair approval

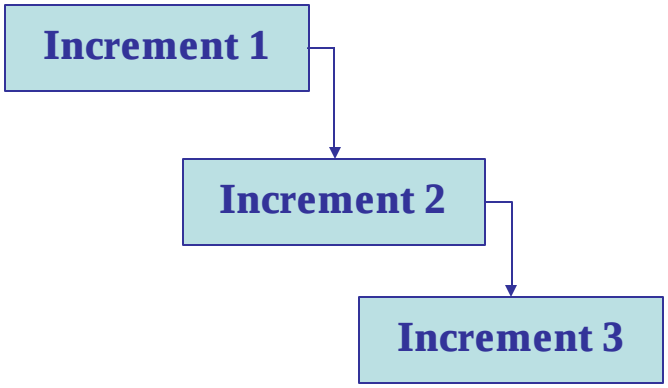
Who Must Submit SRDRs?

- Established via DoD Instruction 5000.2 policy

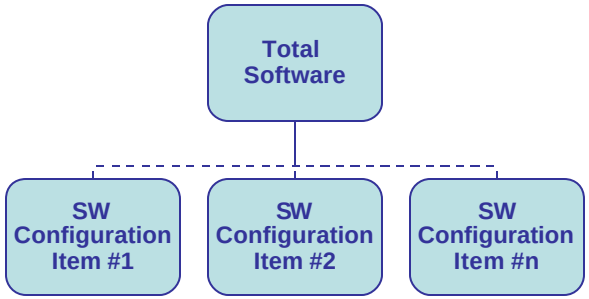
  "All major contracts and subcontracts, regardless of contract type, for contractors developing/producing software elements within ACAT I and ACAT IA programs for any software development element with a projected software effort greater than $25M (FY 2002 constant dollars)"

- Specific SRDR implementation guidance is provided in DOD 5000.4-M-2

What Constitutes SW Development?

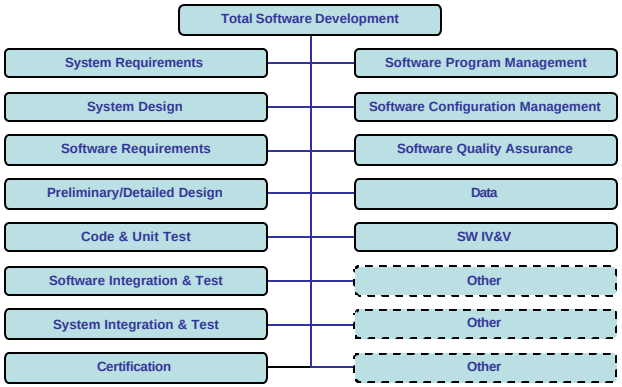


Consider All Increments

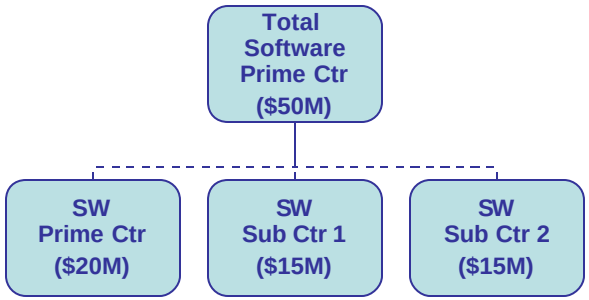


Consider All Components

The Government Uses a Comprehensive Definition



Consider All Activities



Consider All Contracts

Who Must Submit SRDRs?

- Prime contractors are required to flow down SRDR requirements to all affected sub-contractors
- Reporting requirement is established on a contract by contract basis, not by individual software element
- All contractors (primes and subs) deliver their SRDR data directly to the government
- A sub-contractor with software development effort < $25M can be aggregated into the prime contractor's SRDR. The prime contractor must receive some minimum amount of data from the sub-contractor

Who Must Submit SRDRs?

- The Responsibility Assignment Matrix (RAM) facilitates the process of determining who must submit SRDRs.
- Identify estimated contract SW value for all contracts (including sub-contracts).
- Useful for uncovering cases where a prime and sub each have SW <$25M, but taken together, they exceed the threshold

Responsibility Assignment Matrix (RAM)

								CFE				GFE	
						Prime Contractor or Sub-Contractor	CUM TOTAL	Prime	Subcontractor 1	Subcontractor 2	Subcontractor 3	Prime	Subcontrcator n
						Description		Radar	Antenna	Software	Display	Test Set	Diagnostic Elec.
						Contractor		RAD-MART	AERIAL INTERNATIONAL	BITS-R-US	Imaging Solutions	ATE Technologies	Faultfinder, Inc.
						Address		Springfield, NE	Pottsville, SD	Portland, CT	Kingstown, NM	Frankline, NY	Parsnip, FL
						Contract Number		D12345-06-C-7890				T78900-06-C-1234	
						Contract Value (Estimated), TY$M	$682.0	$550.0	$45.0	$102.0	$20.0	$132.0	$41.0
						Software Contract Value (Estimated), TY$M	$158.0	$125.0		$85.0	$7.0	$33.0	$17.0
						Government Organization or PARM		Defense Electronics Command	Defense Electronics Command	Defense Electronics Command	Defense Electronics Command	Defense Test Command	Defense Test Command
						CSDR Direct Reporting per CWIPT (Yes/No)		Yes	Yes	Yes	No	Yes	Yes
WBS Element Code	WBS												
	L1	L2	L3	L4	L5								
1	RADAR SYSTEM							X					
1.1		PRIME MISSION PRODUCT						X					
1.1.1			DISPLAY					X			X		
1.1.2			RECEIVER/TRANSMITTER					X					
1.1.3			ANTENNA						X				
1.1.3.1				PEDESTAL					X				
1.1.3.1.1					HOUSING				X				
1.1.3.1.2					PLATFORM				X				
1.1.3.1.3					GYRO				X				
1.1.3.2				SAIL					X				
1.1.3.3				WAVEGUIDE					X				
1.1.4			SOFTWARE					X		X	X		
1.2		SE/PM						X					
1.3		ST&E						X					
1.4		TRAINING						X					
1.5		DATA						X					
1.6		SUPPORT EQUIPMENT						X					
1.6.1			TEST & MEASUREMENT EQUIP.					X					
1.6.1.1				MAINTENANCE TEST SET								X	
1.6.1.1.1					DIAGNOSTIC ELEC.								X
1.6.1.1.2					DISPLAYS/CONTROLS							X	
1.6.1.1.3					SOFTWARE							X	X
1.6.1.1.4					RACKS							X	
1.6.1.2				CALIBRATION GAUGES				X					
1.6.2			SUPPORT & HANDLING EQUIP.					X					
1.7		SPARES						X					

PRACTICAL EXERCISE
10 MINUTES

- *Using the materials provided,*
  - *identify all direct reporting contractors*
  - *Identify who is responsible for submitting the data*

SRDR Planning

1. Identify SRDR reporting contractors (Who?)
2. Identify and customize data elements (What?)
3. Identify system components to report (Where?)
4. Identify reporting events (When?)
5. Develop customized SRDR and dictionary (How?)
6. Develop draft RFP and CDRL language
7. Provide to prospective contractors and request comments
8. Finalize package and submit for CAIG Chair approval

Identify Software Data Elements

- What specific data elements are required in the SRDR submission?
- There are four broad areas of data elements
  - Descriptive/context data
  - Software sizing data
  - Software effort data
  - Software schedule data
- All four areas must be addressed in the SRDRs
- One additional area, SW Quality is optional

Identify Software Data Elements

- The requested data elements should
  - Encompass a small set (no dragnet)
  - Address the needs of the DoD cost analysts
  - Be objective and measurable
  - Align to data and information that a contractor would normally generate and use internally
  - Be sufficiently generic to ensure broad applicability across a variety of software cost estimating tools/approaches
- The DD 2630 form reflects the types of desired data DoD cost analysts need and establishes a **template** for reporting software data

Identify Software Data Elements

DD2630 Template Page 1
Section 1-Report Context

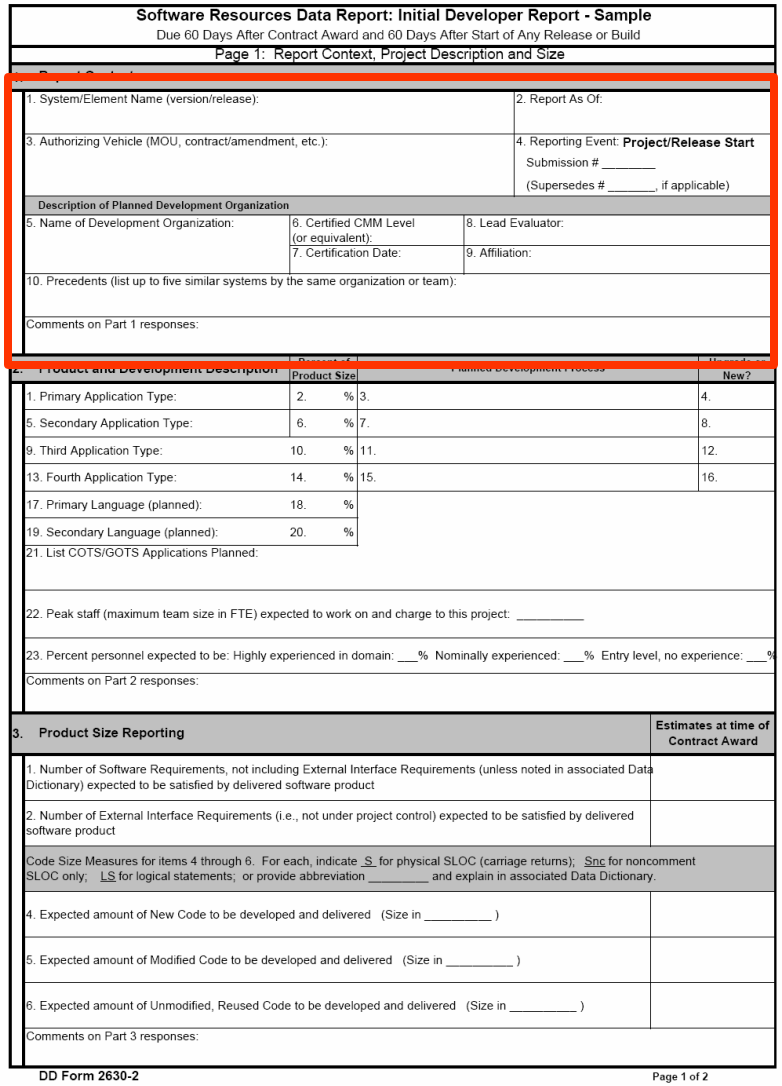
1. **System/Element Name**
2. **Report As Of**
3. **Authorizing Vehicle**

4a. Reporting Event

4b. Submission #

4c. Supersedes #

5. **Name of Development Organization**
6. **Certified CMM level or Equivalent**
7. **Certification Date**
8. **Lead Evaluator**
9. **Affiliation**
10. **Precedents**



Software Resources Data Report: Initial Developer Report - Sample

Due 60 Days After Contract Award and 60 Days After Start of Any Release or Build

Page 1: Report Context, Project Description and Size

1. System/Element Name (version/release):	2. Report As Of:
3. Authorizing Vehicle (MOU, contract/amendment, etc.):	4. Reporting Event: **Project/Release Start** Submission # _____ (Supersedes # _____, if applicable)

Description of Planned Development Organization

5. Name of Development Organization:	6. Certified CMM Level (or equivalent):	8. Lead Evaluator:
	7. Certification Date:	9. Affiliation:

10. Precedents (list up to five similar systems by the same organization or team):

Comments on Part 1 responses:

2. Product and Development Description	Percent of Product Size	Planned Development Process	New?
1. Primary Application Type:	2. %	3.	4.
5. Secondary Application Type:	6. %	7.	8.
9. Third Application Type:	10. %	11.	12.
13. Fourth Application Type:	14. %	15.	16.
17. Primary Language (planned):	18. %		
19. Secondary Language (planned):	20. %		

21. List COTS/GOTS Applications Planned:

22. Peak staff (maximum team size in FTE) expected to work on and charge to this project: _____

23. Percent personnel expected to be: Highly experienced in domain: ___% Nominally experienced: ___% Entry level, no experience: ___%

Comments on Part 2 responses:

3. Product Size Reporting	Estimates at time of Contract Award
1. Number of Software Requirements, not including External Interface Requirements (unless noted in associated Data Dictionary) expected to be satisfied by delivered software product	
2. Number of External Interface Requirements (i.e., not under project control) expected to be satisfied by delivered software product	
Code Size Measures for items 4 through 6. For each, indicate S for physical SLOC (carriage returns); Snc for noncomment SLOC only; LS for logical statements; or provide abbreviation _____ and explain in associated Data Dictionary.	
4. Expected amount of New Code to be developed and delivered (Size in _____)	
5. Expected amount of Modified Code to be developed and delivered (Size in _____)	
6. Expected amount of Unmodified, Reused Code to be developed and delivered (Size in _____)	

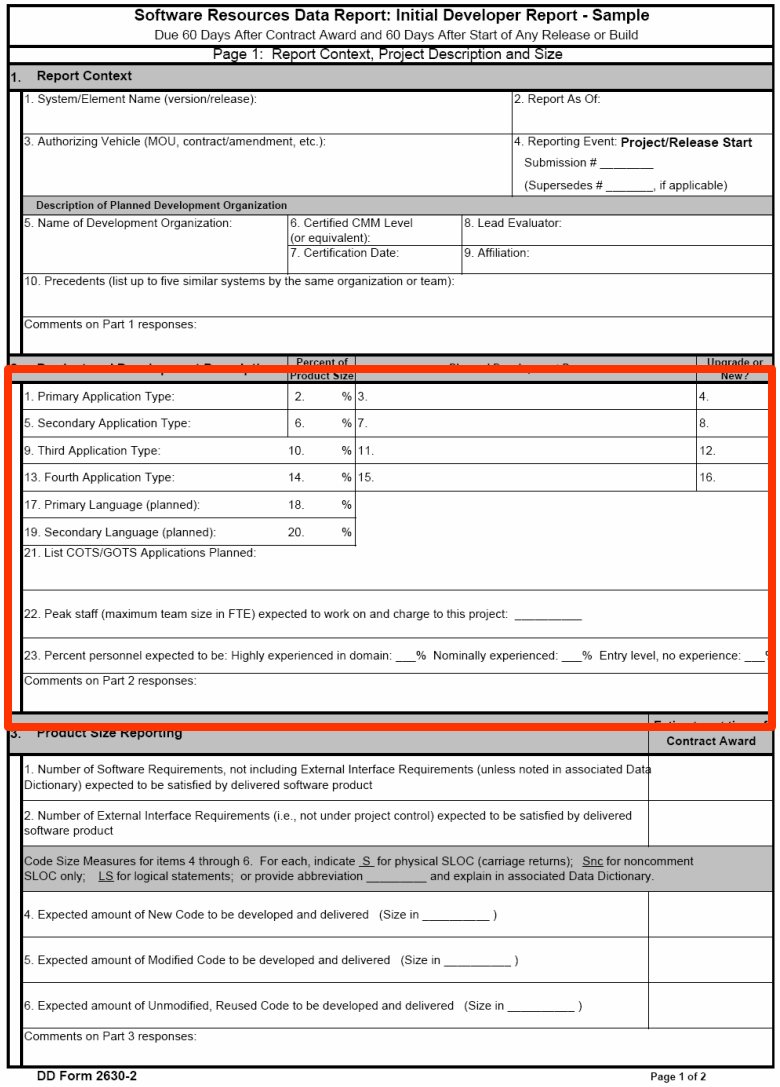
Comments on Part 3 responses:

DD Form 2630-2 Page 1 of 2

Identify Software Data Elements

DD 2630 Template Page 1
Section 2-Product and Development Description

1. Primary Application Type
2. Percent of Product Size
3. Planned Development Process
4. Upgrade or New?
5. Secondary Application Type
6. Percent of Product Size
7. Planned Development Process
8. Upgrade or New?
9. Third Application Type
10. Percent of Product Size
11. Planned Development Process
12. Upgrade or New?
13. Fourth Application Type
14. Percent of Product Size
15. Planned Development Process
16. Upgrade or New?
17. Primary Language
18. Percent of Product Size
19. Secondary Language
20. Percent of Product Size
21. COTS/GOTS Applications Used
22. Peak Staff
23. Personnel Experience



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9. Third Application Type:	10. %	11.	12.
13. Fourth Application Type:	14. %	15.	16.
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19. Secondary Language (planned):	20. %		

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Comments on Part 2 responses:

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4. Expected amount of New Code to be developed and delivered (Size in _____)	
5. Expected amount of Modified Code to be developed and delivered (Size in _____)	
6. Expected amount of Unmodified, Reused Code to be developed and delivered (Size in _____)	

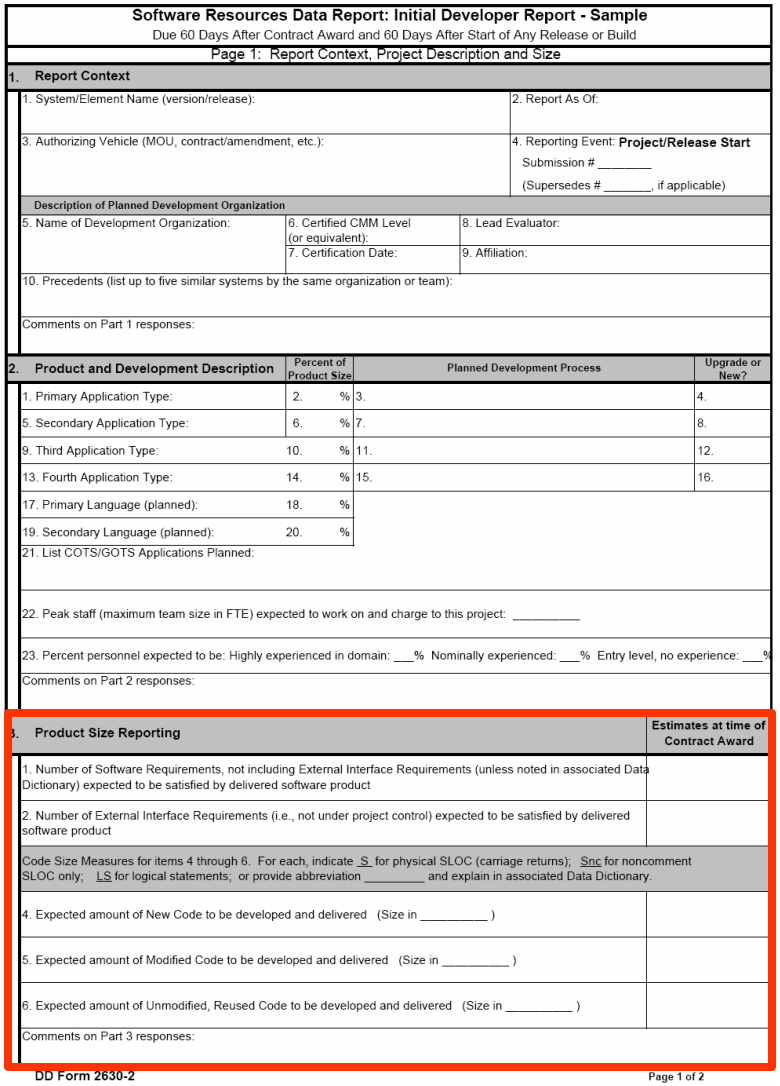
Comments on Part 3 responses:

DD Form 2630-2 Page 1 of 2

Identify Software Data Elements

DD2630 Template Page 1
Section 3-Product Size Reporting

1. **Number of Software Requirements (Internal)**
2. **Number of External Interface Requirements**
3. **Custom Size Units**
4. **New Code Developed and Delivered**
5. **Modified Code Developed and Delivered**
6. **Unmodified, Reused Code Developed and Delivered**



Software Resources Data Report: Initial Developer Report - Sample

Due 60 Days After Contract Award and 60 Days After Start of Any Release or Build

Page 1: Report Context, Project Description and Size

1. Report Context

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13. Fourth Application Type:	14. %	15.	16.
17. Primary Language (planned):	18. %		
19. Secondary Language (planned):	20. %		

21. List COTS/GOTS Applications Planned:

22. Peak staff (maximum team size in FTE) expected to work on and charge to this project: _____

23. Percent personnel expected to be: Highly experienced in domain: ___% Nominally experienced: ___% Entry level, no experience: ___%

Comments on Part 2 responses:

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6. Expected amount of Unmodified, Reused Code to be developed and delivered (Size in _____)	

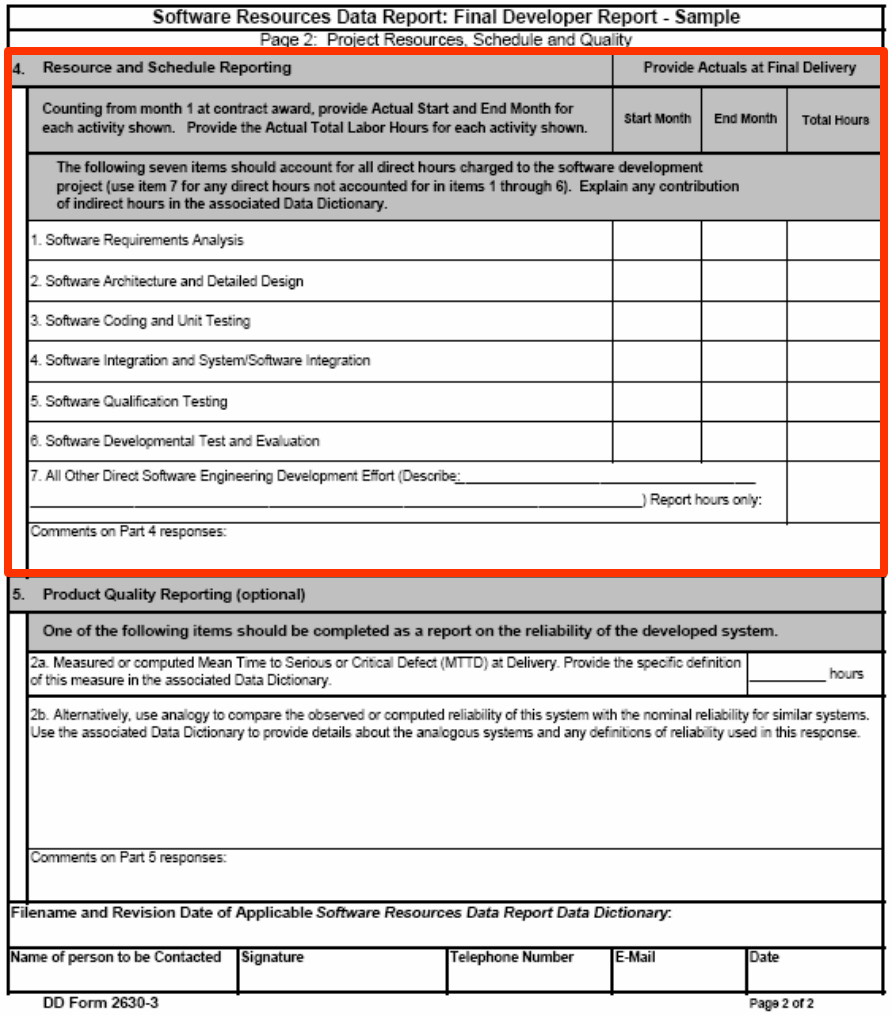
Comments on Part 3 responses:

DD Form 2630-2 Page 1 of 2

Identify Software Data Elements

DD2630 Template Page 2
Section 4-Resource and Schedule Reporting

1. **Software Requirements Analysis**
2. **Software Architecture and Detailed Design**
3. **Software Coding and Unit Testing**
4. **Software Integration and System/Software Integration**
5. **Software Qualification Testing**
6. **Software Developmental Test and Evaluation**
7. **Other Direct Engineering Development**



Software Resources Data Report: Final Developer Report - Sample

Page 2: Project Resources, Schedule and Quality

4. Resource and Schedule Reporting — **Provide Actuals at Final Delivery**

Counting from month 1 at contract award, provide Actual Start and End Month for each activity shown. Provide the Actual Total Labor Hours for each activity shown.	Start Month	End Month	Total Hours
The following seven items should account for all direct hours charged to the software development project (use item 7 for any direct hours not accounted for in items 1 through 6). Explain any contribution of indirect hours in the associated Data Dictionary.			
1. Software Requirements Analysis			
2. Software Architecture and Detailed Design			
3. Software Coding and Unit Testing			
4. Software Integration and System/Software Integration			
5. Software Qualification Testing			
6. Software Developmental Test and Evaluation			
7. All Other Direct Software Engineering Development Effort (Describe:_____) Report hours only:			

Comments on Part 4 responses:

5. Product Quality Reporting (optional)

One of the following items should be completed as a report on the reliability of the developed system.

2a. Measured or computed Mean Time to Serious or Critical Defect (MTTD) at Delivery. Provide the specific definition of this measure in the associated Data Dictionary. _____ hours

2b. Alternatively, use analogy to compare the observed or computed reliability of this system with the nominal reliability for similar systems. Use the associated Data Dictionary to provide details about the analogous systems and any definitions of reliability used in this response.

Comments on Part 5 responses:

Filename and Revision Date of Applicable *Software Resources Data Report Data Dictionary*:

Name of person to be Contacted	Signature	Telephone Number	E-Mail	Date

DD Form 2630-3 Page 2 of 2

Identify Software Data Elements

DD2630 Template Page 2
Section 5-Product Quality

2a. Mean Time to Serious or Mission Critical Defect (MTTD)

2b. Analogous reliability

1. ***This Section is not applicable for initial reporting (2630-2)***
2. ***Product Quality Reporting is considered an optional reporting item. This item is included based on the recommendation of the CWIPT.***

Software Resources Data Report: Final Developer Report - Sample

Page 2: Project Resources, Schedule and Quality

4. Resource and Schedule Reporting	Provide Actuals at Final Delivery		
Counting from month 1 at contract award, provide Actual Start and End Month for each activity shown. Provide the Actual Total Labor Hours for each activity shown.	Start Month	End Month	Total Hours
The following seven items should account for all direct hours charged to the software development project (use item 7 for any direct hours not accounted for in items 1 through 6). Explain any contribution of indirect hours in the associated Data Dictionary.			
1. Software Requirements Analysis			
2. Software Architecture and Detailed Design			
3. Software Coding and Unit Testing			
4. Software Integration and System/Software Integration			
5. Software Qualification Testing			
6. Software Developmental Test and Evaluation			
7. All Other Direct Software Engineering Development Effort (Describe:_____) Report hours only:			
Comments on Part 4 responses:			

5. Product Quality Reporting (optional)	
One of the following items should be completed as a report on the reliability of the developed system.	
2a. Measured or computed Mean Time to Serious or Critical Defect (MTTD) at Delivery. Provide the specific definition of this measure in the associated Data Dictionary.	_____ hours
2b. Alternatively, use analogy to compare the observed or computed reliability of this system with the nominal reliability for similar systems. Use the associated Data Dictionary to provide details about the analogous systems and any definitions of reliability used in this response.	
Comments on Part 5 responses:	

Filename and Revision Date of Applicable *Software Resources Data Report Data Dictionary*:

Name of person to be Contacted	Signature	Telephone Number	E-Mail	Date

DD Form 2630-3 Page 2 of 2

Identify Software Data Elements

- It is the CWIPT's responsibility to tailor the SRDR data items
- While tailoring the SRDR, the CWIPT should
  - Align data fields directly to contractor's in-house SW metrics and accounting system
  - Reflect any preexisting knowledge of the software components that comprise the system (especially if the program is considered an upgrade development)
  - Determine which contractors shall report lower level details (i.e. CSCI level detail)

An Example of Tailoring

Original 2630 Form

3. Product Size Reporting	Estimates at time of Contract Award
1. Number of Software Requirements, not including External Interface Requirements (unless noted in associated Data Dictionary) expected to be satisfied by delivered software product	
2. Number of External Interface Requirements (i.e., not under project co	
Code Size Measures for items 4 through 6. For each, indicate S for ph SLOC only; LS for logical statements; or provide abbreviation _____	
4. Expected amount of New Code to be developed and delivered (Size	
5. Expected amount of Modified Code to be developed and delivered (	
~~6. Expected amount of Unmodified, Reused Code to be developed and~~	
Comments on Part 3 responses:	

DD Form 2630-2

This contractor does not use the metric 'Unmodified SLOC'. Instead, it has five additional categories of SLOC that are tracked. Therefore its SRDR form is tailored to track to its internal metrics.

Tailored Form

3. Product Size Reporting	Estimates at time of Contract Award
1. Number of Software Requirements, not including External Interface Requirements (unless noted in associated Data Dictionary) expected to be satisfied by delivered software product	
2. Number of External Interface Requirements (i.e., not under project control) expected to be satisfied by delivered software product	
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4. Expected amount of New Code to be developed and delivered (Size in _____)	
5. Expected amount of Modified Code to be developed and delivered (Size in _____)	
6. Expected amount of **Translated** Code to be developed and delivered (Size in _____)	
7. Expected amount of **Ported** Code to be developed and delivered (Size in _____)	
8. Expected amount of **External Reused** Code to be developed and delivered (Size in _____)	
9. Expected amount of **Internal Reused** Code to be developed and delivered (Size in _____)	
10. Expected amount of **Legacy Reused** Code to be developed and delivered (Size in _____)	
Comments on Part 3 responses:	

DD Form 2630-2 **Page 1 of 2**

Precautions When Tailoring

- Equivalent New Source Lines of Code (ESLOC) and Delivered Source Lines of Code (DSLOC) are not valid as primary SRDR sizing metrics
  - ESLOC reflects a weighted sum *computation* and is not a measurement
  - Neither provides visibility of new development versus reuse
  - They can be provided as *supplemental* information
- Alternative sizing metrics (e.g. Function Points) in lieu of SLOC are permitted
  - Must provide a clear definition in the dictionary
  - Must be used on both the 2630-2 and 2630-3 (i.e. Cannot use alternative metric on 2630-2 and then revert to SLOC on 2630-3)
  - Should allow independent verification of the project size by examining the software products produced by the development.

How Are the Data Used?

- Government software cost estimates use projected SW size, growth, and vendor productivity
- Data collected using SRDRs provide evidence of what actually happened on programs of interest
  - Actual size by application type/language provides the main cost driving information.
  - Size and requirements data at beginning and end gives us empirical basis for estimating size growth risk
  - Effort by activity provides productivity data and assurance of an "apples to apples" comparison
  - Defect data can provide some sense of "completeness" (latent deficiencies) to calibrate re-use cost on future programs
  - Schedule data provides a sense of projected schedule realism
  - Staffing data provides insight into developer's resource constraints

SRDR Planning

1. Identify SRDR reporting contractors (Who?)
2. Identify and customize data elements (What?)
3. Identify system components to report (Where?)
4. Identify reporting events (When?)
5. Develop customized SRDR dictionary (How?)
6. Develop draft RFP and CDRL language
7. Provide to prospective contractors and request comments
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Identify System Components to Report

- What elements within the system require software development?
- Software development occurs throughout the system
  - Embedded software within prime mission equipment
  - Applications running on general purpose computers
  - Mission simulator software within training equipment
  - Support software such as mission planning
  - Specialized test software such as SIM/STIM
- For every element identified, it must ultimately be discretely reported in the SRDR

Identify System Components to Report

COST AND SOFTWARE DATA REPORTING PLAN

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 15 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden to Department of Defense, Washington Headquarters Service, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204 Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provisions of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1a. PROGRAM	2a. WEAPON SYSTEM TYPE	3. SUBMISSION TYPE	4. DATE AS OF *(MM/DD/YY)*	5. REPORT DATE *(MM/DD/YY)*
Mountain DEW	**Unmanned Aerial Vehicle**	[X] INITIAL SUBMISSION [ ] CHANGE	**4/1/2005**	**4/1/2005**

1b. MILESTONE A [ ] B [X] C: LRIP [ ] C: PROD [ ]

6. POINT OF CONTACT (POC) INFORMATION a. POC AND ADDRESS (Include ZIP Code)	6b. TELEPHONE NUMBER (include area code)	7. WBS	8. PREPARING ORGANIZATION
F. Binight-UAV Inc. **56 Runway Road** **Los Angeles, CA 90003**	**323-233-6756** 6c. FAX NUMBER (include area code) **323-967-6510** 6d. E-MAIL: **fbinight@uavinc.com**	[ ] PROGRAM [X] CONTRACT	**Mountain DEW Joint Program Office** 9. REVIEW AND REFERENCE NUMBER

10. WBS ELEMENT CODE		11. WBS REPORTING ELEMENTS	12. CONTRACTOR (DUNS Code)	13. CONTRACT NUMBER	14. REPORT FREQUENCY			
a. PROGRAM	b. CONTRACT				a. DD 1921 REQUIRED	b. DD 1921-1 (Part I) REQUIRED	c. DD 1921-1 (Part II) REQUIRED	d. DD 2630 REQUIRED
1.0		Unmanned Aerial Vehicle	UAV Inc		X	X		
1.1		Air Vehicle			X	X	X	
1.1.1		Airframe			X	X		
1.1.2		Propulsion			X	X		
1.1.3		AV Applications Software			X	X		
1.1.4		AV System Software			X	X		
1.1.5		Communications/Identification			X	X		
1.1.5.1		Communications/Identification-Hardware			X	X		
1.1.5.2		Communications/Identification-Software			X	X		
1.1.6		Navigation/Guidance			X	X		
1.1.6.1		Navigation/Guidance-Hardware			X	X		
1.1.6.2		Navigation/Guidance-Software			X	X		
1.1.7		Central Computer			X	X		
1.1.8		Automatic Flight Control			X	X		
1.1.8.1		Automatic Flight Control-Hardware			X	X		
1.1.8.2		Automatic Flight Control-Software			X	X		
1.1.9		Integration, Assembly, Test and Checkout			X	X		
1.2		Payload			X	X	X	
1.3		Ground Segment			X	X		
1.3.1		Ground Control			X	X		
1.3.1.1		Ground Control-Hardware			X	X		
1.3.1.2		Ground Control-Software			X	X		
1.3.2		Launch & Recovery			X	X		
1.3.2.1		Launch & Recovery-Hardware			X	X		
1.3.2.2		Launch & Recovery-Software			X	X		
1.3.3		Transport Vehicles			X	X		
1.3.4		Transport Storage Containers			X	X		
1.3.5		Auxilliary Ground Equipment			X	X		
1.4		Systems Engineering/ Program Management			X			
1.5		System Test and Evaluation			X			
1.5.1		Development Test and Evaluation			X			
1.5.2		Operational Test and Evaluation			X			
1.5.3		Mock-ups			X			
1.5.4		Test and Evaluation Support			X			
1.5.5		Test Facilities			X			
1.6		Training			X			

SRDR reporting requirements are specified in Box 14d of Cost and software Data Reporting Plan (DD 2794).

Initial SW Reporting Reqt's are identified by the CWIPT on the Program Plan and elaborated on the Contract Plan.

Rule of Thumb: If it's got 'SLOC', put an 'X' in the 2630 block.

COST AND SOFTWARE DATA REPORTING PLAN

Form Approved
OMB No. 0704-0188

1a. PROGRAM	2a. WEAPON SYSTEM TYPE	3. SUBMISSION TYPE	4. DATE AS OF *(MM/DD/YY)*	5. REPORT DATE *(MM/DD/YY)*
Mountain DEW	**Unmanned Aerial Vehicle**	[X] INITIAL SUBMISSION [ ] CHANGE	**4/1/2005**	**4/1/2005**
1b. MILESTONE A [ ] B [X] C: LRIP [ ] C: PROD [ ]				

6. POINT OF CONTACT (POC) INFORMATION a. POC AND ADDRESS (Include ZIP Code)	6b. TELEPHONE NUMBER (include area code) **323-233-6756** 6c. FAX NUMBER (include area code) **323-967-6510** 6d. E-MAIL: **fbinight@uavinc.com**	7. WBS [ ] PROGRAM [X] CONTRACT	8. PREPARING ORGANIZATION **Mountain DEW Joint Program Office** 9. REVIEW AND REFERENCE NUMBER
F. Binight-UAV Inc. **56 Runway Road** **Los Angeles, CA 90003**			

10. WBS ELEMENT CODE		11. WBS	12. CONTRACTOR	13. CONTRACT	14. REPORT FREQUENCY			
a. PROGRAM	b. CONTRACT	REPORTING ELEMENTS	(DUNS Code)	NUMBER	a. DD 1921 REQUIRED	b. DD 1921-1 (Part I) REQUIRED	c. DD 1921-1 (Part II) REQUIRED	d. DD 2630 REQUIRED
1.0		Unmanned Aerial Vehicle	UAV Inc		X	X		
1.1		Air Vehicle			X	X	X	
1.1.1		Airframe			X	X		
1.1.2		Propulsion			X	X		
1.1.3		AV Applications Software			X	X		X
1.1.4		AV System Software			X	X		X
1.1.5		Communications/Identification			X	X		
1.1.5.1		Communications/Identification-Hardware			X	X		
1.1.5.2		Communications/Identification-Software			X	X		X
1.1.6		Navigation/Guidance			X	X		
1.1.6.1		Navigation/Guidance-Hardware			X	X		
1.1.6.2		Navigation/Guidance-Software			X	X		X
1.1.7		Central Computer			X	X		X
1.1.8		Automatic Flight Control			X	X		
1.1.8.1		Automatic Flight Control-Hardware			X	X		
1.1.8.2		Automatic Flight Control-Software			X	X		X
1.1.9		Integration, Assembly, Test and Checkout			X	X		
1.2		Payload			X	X	X	X
1.3		Ground Segment			X	X		
1.3.1		Ground Control			X	X		
1.3.1.1		Ground Control-Hardware			X	X		
1.3.1.2		Ground Control-Software			X	X		X
1.3.2		Launch & Recovery			X	X		
1.3.2.1		Launch & Recovery-Hardware			X	X		
1.3.2.2		Launch & Recovery-Software			X	X		X
1.3.3		Transport Vehicles			X	X		
1.3.4		Transport Storage Containers			X	X		
1.3.5		Auxilliary Ground Equipment			X	X		
1.4		Systems Engineering/ Program Management			X			
1.5		System Test and Evaluation			X			
1.5.1		Development Test and Evaluation			X			
1.5.2		Operational Test and Evaluation			X			
1.5.3		Mock-ups			X			
1.5.4		Test and Evaluation Support			X			
1.5.5		Test Facilities			X			
1.6		Training			X			X

Identify System Components to Report

- Do's and Don'ts
  - Do identify all elements requiring software development (even if the development is performed by a sub-contractor)
  - Don't places x's on non-software products such as integration or systems engineering
  - Don't omit reporting because a software element fails to exceed $25M. The overall SRDR requirement is established at the contract level.

PRACTICAL EXERCISE
20 MINUTES

- *Using the materials provided,*
  - *Part 1: Determine which elements are appropriate for SRDR reporting*
  - *Part 2: Using a draft contract plan matrix, identify which software development elements require SRDR reporting*

SRDR Planning

1. Identify SRDR reporting contractors (Who?)
2. Identify and customize software data elements (What?)
3. Identify system components to report (Where?)
4. Identify reporting events (When?)
5. Develop customized SRDR dictionary (How?)
6. Develop draft RFP and CDRL language
7. Provide to prospective contractors and request comments
8. Finalize package and submit for CAIG Chair approval

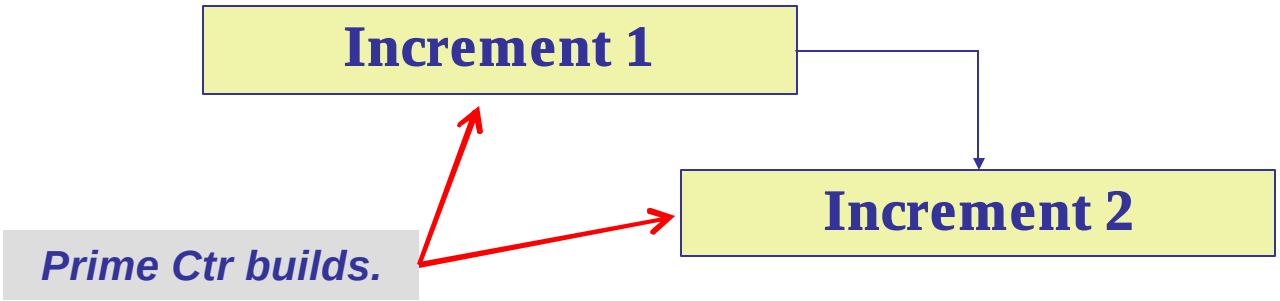
Identify Reporting Events

- SRDR reporting is required for two types of events
  - Contract Event: SRDR is required at contract start (2630-2) and at contract completion (2630-3)
  - Product Event: SRDR is required at start of a product 'increment' (2630-2) and at completion of product 'increment' (2630-3)
- Reporting events are specified in Box 15 of the *Contract Plan* (DD 2794).
- Do not include the Initial Gov't Report (2630-1) on the contract plan. This SRDR submission should be identified on the *program plan.*

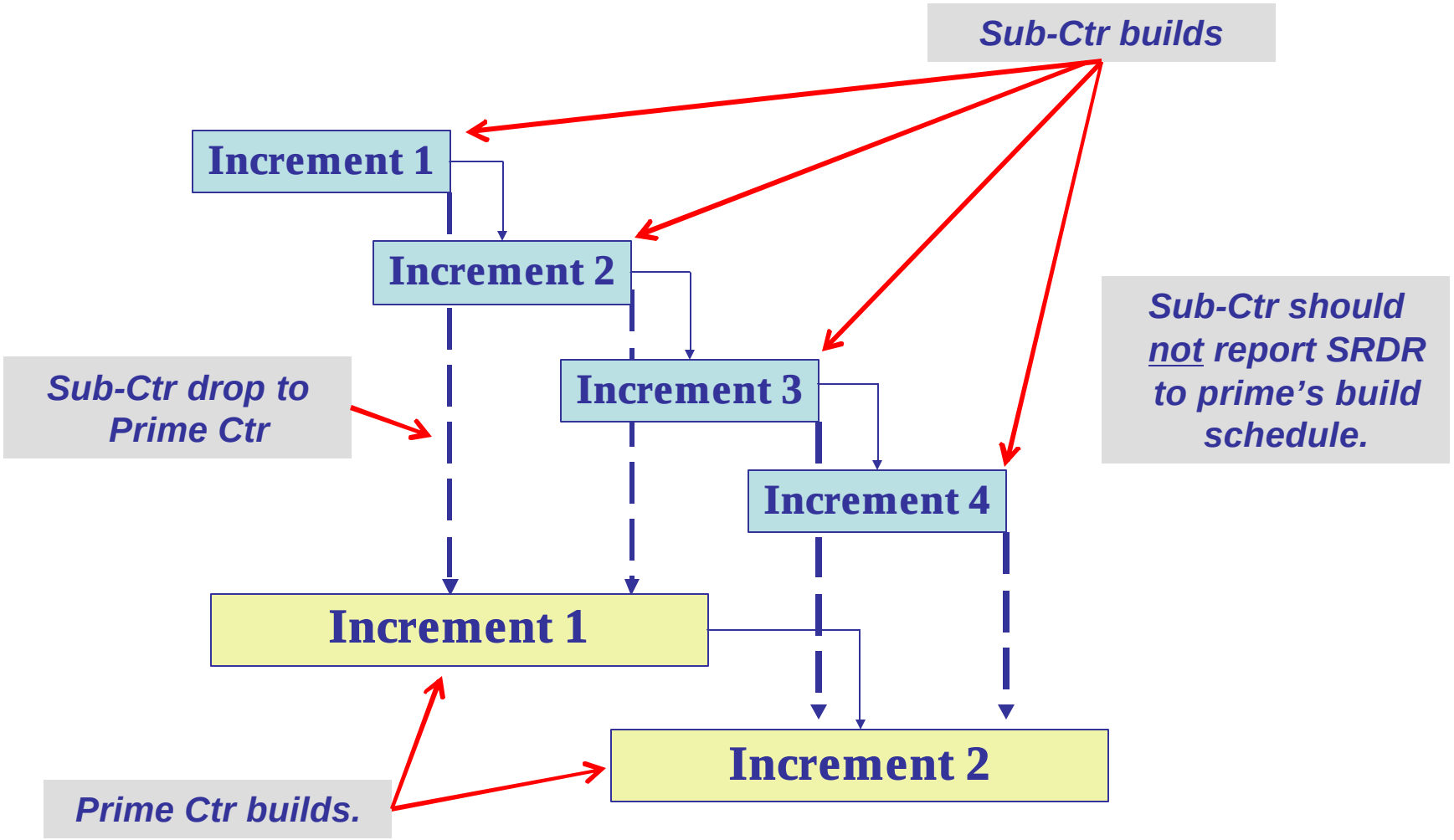
Identify Reporting Events

- What is the definition of an ‘increment’?
  - A partial delivery of a product capability
  - Sometimes referred to as *spiral, increment, build, release, etc*
  - It is not intended to be used for tracking the contractor’s internal engineering builds which generally consist of many builds
- For sub-contractors, an increment would be defined as a partial delivery of product to the prime contractor (possibly on a build schedule different than the prime’s build schedule)
- These definitions should be clearly defined and agreed upon by the CWIPT and included in the SRDR dictionary

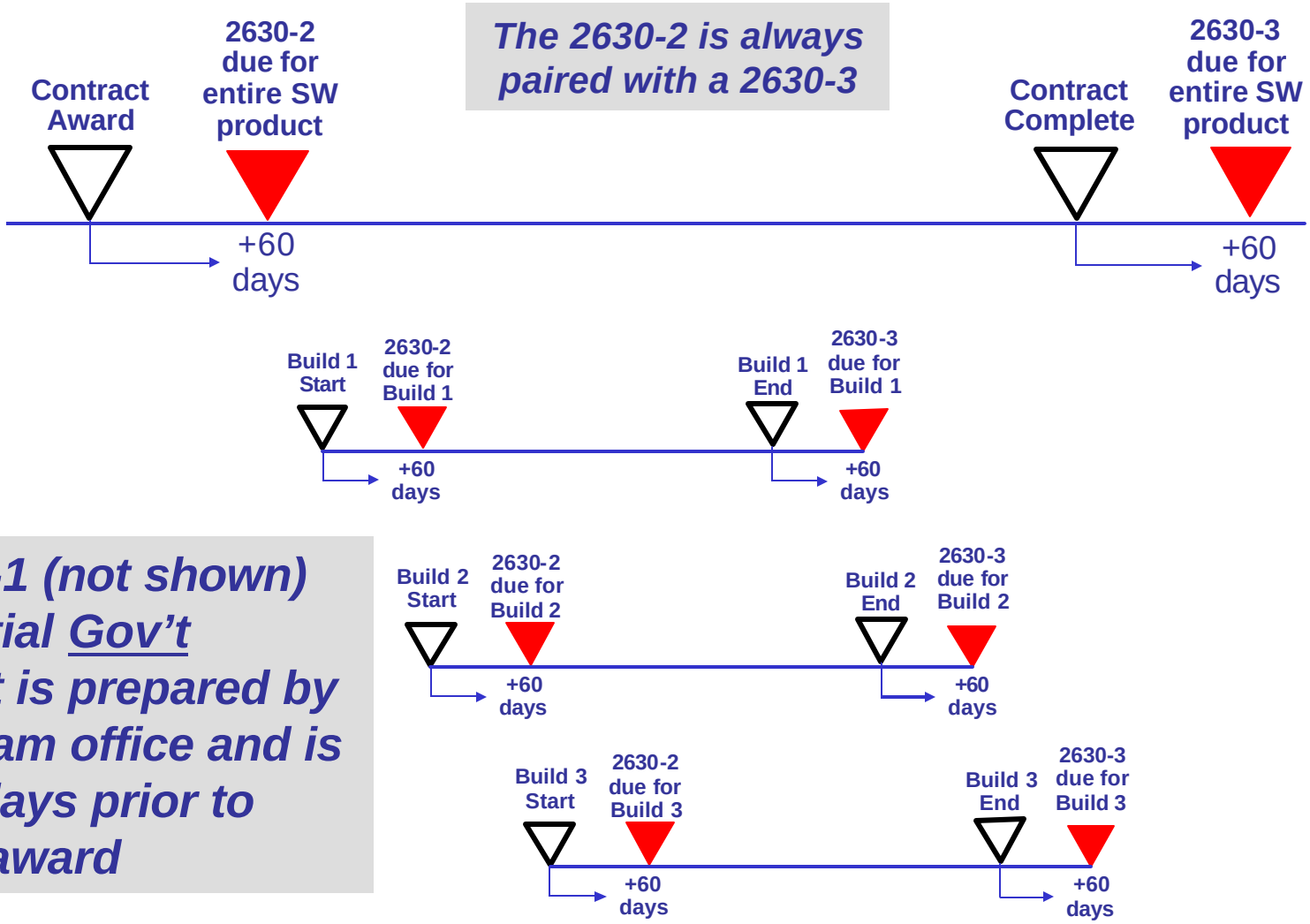
What is an Increment?



What is an Increment?



Identify Reporting Events



The 2630-1 (not shown) is the Initial <u>Gov't</u> Report. It is prepared by the program office and is due 180 days prior to contract award

Identify Reporting Events

15 CCDR SUBMISSION				
15a. SUBMISSION	15B. FORM	15C. EVENT	15D. AS OF DATE	15e. DUE DATE
1	1921, 1921-1 Part 1	UAV Inc Initial Report (Contract Awd 6/1/2006)	9/30/2006	11/29/2006
2	1921, 1921-1 Part 1	UAV Inc Interim Report (CDR 7/1/2008)	1/1/2008	3/1/2008
3	1921, 1921-1 Part 1	UAV Inc Final Report	5/5/2010	7/4/2010
4	2630-2	UAV Inc Initial Report (Contract Awd 6/1/2006)	6/1/2006	7/31/2006
5	2630-2	UAV Inc Initial Report (Inc 1 7/1/2006)	7/1/2006	8/30/2006
6	2630-3	UAV Inc Final Report (Inc 1 8/1/2007)	8/1/2007	9/30/2007
7	2630-2	UAV Inc Initial Report (Inc 2 1/1/2007)	1/1/2007	3/2/2007
8	2630-3	UAV Inc Final Report (Inc 2 10/1/2009)	10/1/2009	11/30/2009
9	2630-3	UAV Inc Final Report (Contract Complete)	5/5/2010	7/4/2010

The 2630-2 is always paired with a 2630-3

- ***Report a 2630-2 and 2630-3 for the entire contract.***
- ***Report a 2630-2 and 2630-3 for each individual software increment/release/build.***
- ***Contracts with only one increment/release/build need only to report a 2630-2 and 2630-3 once for the entire contract.***

PRACTICAL EXERCISE
15 MINUTES

- *Using the materials provided,*
  - *Identify all appropriate SRDR reporting events for a draft contract plan*

SRDR Planning

1. Identify SRDR reporting contractors (Who?)
2. Identify and customize data elements (What?)
3. Identify system components to report (Where?)
4. Identify reporting events (When?)
5. Develop customized SRDR dictionary (How?)
6. Develop draft RFP and CDRL language
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Develop SRDR Dictionary

- The SRDR dictionary is an integral part of the SRDR submission
- Any submission of a report in the DD Form 2630 series must be accompanied by an explanatory document, known as a SRDR Data Dictionary, which explains data definitions and any details required to correctly interpret the responses
- Failure to submit an adequate dictionary will result in a rejection of the entire SRDR submission.

Develop SRDR Dictionary

- The intent of the dictionary is twofold
  - For the user of the data (government cost analysts), the dictionary provides overall context of the system and development and it facilitates interpretation of the data.
  - For the data provider, the dictionary precisely defines each of the elements provided and establish the rules necessary to collect and report the information.
- The dictionary can be a separate document file or it can be embedded within the SRDR itself (example: A separate dictionary tab within an SRDR Excel file)

Develop SRDR Dictionary

- The SRDR Manual (DoD 5000.4-M-2) contains a sample data dictionary that defines all data fields within the 2630 template
- Consider the sample as a *point of departure* for tailoring to the contractor's accounting and metric systems.
- Examples of areas to tailor:
  - Counting SLOC
  - SLOC Categories (i.e. New, Mod, Reused, etc)
  - Rules used to classify LOC into SLOC categories
  - Company standard classification (and definitions) of discrete SW development activities
  - Breakdown and tallying of requirements counts
  - Identification and tallying of interface counts
  - etc

Dictionary Example

From SRDR Manual

4. New Code

~~Most software projects utilize a combination of new, reused, and generated code to accomplish the required function.~~ Any code that was developed specifically for this project, or was reused or generated by tools but then extensively modified (more than ~~25%~~ of the lines changed or added), is considered new code. Code generator inputs prepared by hand, such as tables or scripts, are also counted as new code.

5. Modified Code

Source code that was generated by tools or obtained from outside the project (even if within the same organization) and was then reused with minor modifications (less than ~~25%~~ modified) by this project is reported under this item. If modifications were substantial (more than a notional ~~25%~~), the code is counted as new (item 4). This assessment should be done at the code unit level and not across the whole project.

6. ~~Reused Code~~

~~Source code that was obtained from outside the project (even if within the same organization) or that was generated by tools and not modified at all is reported under item 6.~~

Customized Dictionary

4. New Code

Any source code file that was developed specifically for this project, or was reused or generated by tools but then extensively modified (more than 30% of the lines changed or added), is considered new code. Code generator inputs prepared by hand, such as tables or scripts, are also counted as new code.

5. Modified Code

Source code that was generated by tools or obtained from outside the project (even if within the same organization) and was then reused with minor modifications (less than 30% modified) by this project is reported under this item. If modifications were substantial (more than a notional 30%), the code is counted as new (item 4). This assessment should be done at the code unit level and not across the whole project.

6. Translated Code

Source code that was obtained from outside the project (even if within the same organization) that required translation from its existing programming language to a new programming language (for example from Ada to C++).

7. Ported Code

Source code that was obtained from outside the project (even if within the same organization) that required adaptation to allow the use of a different computer processor and/or a different operating system. (Example from PC/WinXP to Apple/MAC OS)

8. External Reused Code

Source code that was obtained from outside the developer that did not require any substantial modification or adaptation effort.

...

Use definitions from the contractor's internal metrics system.

SRDR Dictionary-Cont'd

Dictionary should also address

- Which measures are tracked cumulatively versus discretely
- Measuring schedule length of an activity
  - Does an activity end when no add'l hours are charged to that activity or
  - Does the activity end upon meeting exit criteria (i.e. successful deliverable)
- Definition of Build Start/End

At contract award (2630-2)	**Provide estimates of the entire completed project at the level of detail agreed upon. Measures should reflect cumulative grand totals.**
At start of a build (2630-2)	**Provide estimates at completion for the build only. Measures such as size, effort, and schedules should reflect build only. Other metrics such as requirement counts, interface counts may reflect current cumulative estimate at completion.**
At end of a build (2630-3)	**Provide actuals for the build only. Measures such as size, effort, and schedules should reflect build only. Other metrics such as requirement counts, interface counts may reflect current cumulative actuals.**
At end of contract (2630-3)	**Provide actuals for the entire contract.**

SRDR Planning

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Draft RFP and CDRL Language

- Use samples from (5000.4-M-2) and DCARC website

RFP Language for Section M, Evaluation:
The contractor's customized SRDR and Data Dictionary

RFP Language for Section L, Instructions:
The government desires software measurement data on the elements identified within the attached Work Breakdown Structure. The data desired for each marked element are contained on the attached sample DD Form 2630 forms (SRDR) and associated definitions and instructions. The government desires to collect a subset of the same data that the contractor normally collects to oversee and manage software development efforts. Therefore, the government expects the contractor to customize or tailor the draft DD Form 2630 forms to be consistent with data it normally collects. The contractor shall propose the software measurement data within a Software Resources Data Collection Plan, which may be part of either a Software Development Plan or a separate Software Measurement Plan. The contractor shall provide a SRDR Data Dictionary with the customized DD Form 2630 forms.
The contractor shall submit a completed DD Form 2630-2 within 60 days after contract award for the entire software product, and within 60 days after initiation of each software release or build. The contractor shall submit a completed DD Form 2630-3 within 120 days of delivery of each delivered software release. The contractor shall submit a completed DD Form 2630-3 for the entire software product within 120 days of delivery of the final software element. Report format and other delivery requirements are specified in the attached CDRL.

Title: Software Resources Data Report: Initial Developer Report (DD Form 2630-3)

Title: Software Resources Data Report: Initial Developer Report (DD Form 2630-2)
Number: **Approval Date:** Draft
AMSC Number: **Limitation:**
DTIC Applicable: No **GIDEP Applicable:** No

Office of Primary Responsibility: (D)OSD/PA&E/CAIG
Applicable Forms: Sample Software Resources Data Report: Initial Developer Report (DD Form 2630-2).
Use/relationship: The DD Form 2630-2 is used to obtain the expected (estimates-at-complete) characteristics of a software product and its development process. These data will be used to compile a database of software product sizes, schedules, effort, and quality that government analysts can draw upon to help predict the cost of new systems.
a) Information to be acquired through these data will include the developer's estimates of software product size, development schedule, peak staff, and direct labor hours.
b) The definitions of the data items are negotiable but must include the three categories of size, schedule, and effort. The contractor must provide a dictionary that defines the data elements contained on the negotiated DD Form 2630-2.
c) The definition of the software product is negotiable but should be a named, controlled, testable, and deliverable program, subsystem, or system. A reportable product can be an incremental version, release or full operating capability, whether or not it will complete the overall system or whether or not some requirements will be deferred to a future delivery or upgrade.

The format and specific contents of this report must be tailored to reflect the negotiated data elements, data definitions, and software system definition to enable relevant and low cost data reporting. Applicable programs are all Major Defense Acquisition Programs (MDAP) that contract for (or write an MOU for) more than $25 million (FY 2002) for software. Subcontracts for more than $25 million (FY 2002) in software development should be reported on separate DD Form 2630-2 submissions, either by the prime contractor or the directly by the subcontractor. Subcontracts for less than $25 million (FY 2002) in software development should be included (rolled-up) in the data reported for the prime contract DD Form 2630-2.

Requirements:
1. *Reference documents*. Interim guidance DODI 5000 *Defense Acquisition* provides mandatory acquisition procedures for MDAP and MAIS programs (30 October 2002). Attachment 2 of this guidance, *Operation of the Defense Acquisition System*, Tab C (Table 3), summarizes contract reporting requirements. Detailed instructions for preparing the DD Form 2630-2, the Software Product Development Report - Initial, are contained in Chapter 3 of the SRDR Manual, DoD 5000.4-M-2.
2. *Format*. The DD Form 2630-2 shall be in the format agreed to by the contractor and the Government as specified in the contractor's Software Development or Measurement Plan.
3. *Content*. The DD Form 2630-2 shall contain estimated software measurement data as described in the contractor's software development plan and software measurement data element dictionary.

Draft RFP and CDRL Language

- Unlike CCDRs, there is no formal SRDR DID, yet
- The tailored DD 2630 form, along with the customized data dictionary constitute the SRDR data item description for the contract
- The SRDR is a customized data deliverable

SRDR Planning

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Provide to contractors and request comments

- Program office should provide
  - Copy of (tailored) 2630s
  - Copy of (tailored) dictionary
- Contractor should
  - Evaluate 2630s and assess their ability to pull the requested information from their metrics and accounting systems
- Suggestion: Prior to contract award, contractor/PMO perform an SRDR dry-run on a recently completed development project

SRDR Planning

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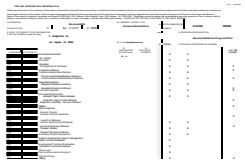
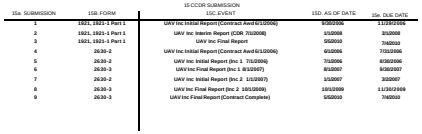
SRDR Planning Package

CSDR PLAN



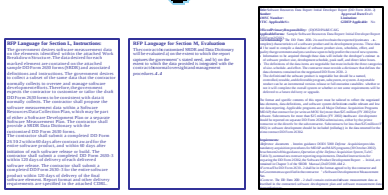
Software Elements



+ Reporting Events

+ Customized Data Elements

+ SRDR Data Dictionary



+ RFP, CDRL, DID

= SW Measurement Plan

Questions / Discussion / Review

- **At this point, you should:**
  - Be familiar with SRDR reporting requirements and thresholds
  - Understand the basic concepts of software reporting in the CSDR planning process
  - Identify the key software reporting items necessary for CSDR plan approval

Additional Resources

- CSDR Reference Book
  - DoD 5000.4-M-2, *Software Resources Data Report (SRDR) Manual*, February 2004 (http://dcarc.pae.osd.mil/srdr/DOD50004M2.pdf)
    - DD Form 2630-2 CDRL (http://dcarc.pae.osd.mil/srdr/srdr_ch5_cdrl_022004.pdf)
    - DD Form 2630-3 CDRL (http://dcarc.pae.osd.mil/srdr/srdr_ch5_cdrl-3_022004.pdf)
  - DD Form 2630-1, *SRDR Initial Government Report,* February 2004 (http://dcarc.pae.osd.mil/srdr/srdr_form_022004.xls)
  - DD Form 2630-2, *SRDR Initial Developer Report,* February 2004 (http://dcarc.pae.osd.mil/srdr/srdr_form_022004.xls)
  - DD Form 2630-3, *SRDR Final Developer Report,* February 2004 (http://dcarc.pae.osd.mil/srdr/srdr_form_022004.xls)